2 ~~33~~. The method of claim 1 ~~32~~, further comprising, prior to applying th pulsed biasing voltage, applying a third biasing voltage to the seed layer, the third biasing voltage being lower than the second biasing voltage.

3 ~~34~~. The method of claim 1 ~~32~~, further comprising, prior to applying the pulsed biasing voltage, applying a third biasing voltage to the seed layer for about 1.5 seconds longer than the application of the pulsed biasing voltage.

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4 ~~35~~. The method of claim 1 ~~32~~, further comprising, prior to applying the pulsed biasing voltage, applying a third biasing voltage to the seed layer for about 1.5 seconds longer than the application of the pulsed biasing voltage, the third biasing voltage being lower than the second biasing voltage.

5 ~~36~~. The method of claim 1 ~~32~~, wherein the first biasing voltage ranges from about 1 volt to about 5 volts.

6 ~~37~~. The method of claim 1 ~~32~~, wherein the second biasing voltage ranges from about 2 volts to about 10 volts.

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7 ~~38~~. The method of claim 1 ~~32~~, wherein the first biasing voltage ranges from about 1 volt to about 5 volts, and wherein the second biasing voltage ranges from about 2 volts to about 10 volts.

8 ~~39~~. The method of claim 1 ~~32~~, wherein the second biasing voltage is about 5 volts.

9 ~~40~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are applied from about 0.25 seconds to about 2 seconds.

10 ~~41~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are applied for less than about 5 seconds.

11 ~~42~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are applied from about 0.25 seconds to about 2 seconds, wherein

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the first biasing voltage ranges from about 1 volt to about 5 volts, and wherein the second biasing voltage ranges from about 2 volts to about 10 volts.

12 ~~43~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are applied for about less than 5 seconds, wherein the first biasing voltage ranges from about 1 to about 5 volts, and wherein the second biasing voltage ranges from about 2 volts to about 10 volts.

13 ~~44~~. The method of claim 1 ~~32~~, wherein the substrate has a 200 mm diameter, and wherein applying the second biasing voltage comprises applying a plating current of about 5.41 amps to the substrate.

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14 ~~45~~. The method of claim 2 ~~33~~, wherein the substrate has a 200 mm diameter, and wherein applying the third biasing voltage comprises applying a plating current of about 3.14 amps to the substrate.

15 ~~46~~. The method of claim 2 ~~33~~, wherein the substrate has a 200 mm diameter, wherein applying the second biasing voltage comprises applying a plating current of about 5.41 amps to the substrate, and wherein applying the third biasing voltage comprises applying a plating current of about 3.14 amps to the substrate.

16 ~~47~~. The method of claim 1 ~~32~~, wherein the pulsed biasing voltage is pulsed for a plurality of cycles as determined by the depth of the one or more features.

17 ~~48~~. The method of claim 1 ~~32~~, wherein the first biasing voltage ranges from about 1 volt to about 5 volts, wherein the second biasing voltage ranges from about 2 volts to about 10 volts, and wherein the pulsed biasing voltage is pulsed for a plurality of cycles as determined by the depth of the one or more features.

18 ~~49~~. The method of claim 1 ~~32~~, wherein the pulsed biasing voltage is pulsed for about fifteen cycles.

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19 ~~50~~. The method of claim ~~32~~ 1, wherein the pulsed biasing voltage is applied for about 4 seconds.

20 ~~51~~. The method of claim ~~32~~ 1, wherein the pulsed biasing voltage is applied from about 1 second to about 7 seconds.

21 ~~52~~. The method of claim ~~32~~ 1, wherein the first biasing voltage and the second biasing voltage are applied from about 0.25 seconds to about 2 seconds, and wherein the pulsed biasing voltage is applied for about 4 seconds.

22 ~~53~~. The method of claim ~~32~~ 1, wherein the first biasing voltage and the second biasing voltage are applied in less time than the pulsed biasing voltage.

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23 ~~54~~. The method of claim ~~32~~ 1, wherein the first biasing voltage and the second biasing voltage are applied from about 0.25 seconds to about 2 seconds, and the pulsed biasing voltage is applied from about 1 second to about 7 seconds; and wherein the first biasing voltage ranges from about 1 volt to about 5 volts, the second biasing voltage ranges from about 2 volts to about 10 volts, and the pulsed biasing voltage is pulsed for about fifteen cycles.

24 ~~55~~. The method of claim ~~32~~ 1, wherein the pulsed biasing voltage comprises a plating biasing voltage alternated by a de-plating biasing voltage.

25 ~~56~~. The method of claim ~~32~~ 1, wherein the pulsed biasing voltage comprises a plating biasing voltage alternated by a de-plating biasing voltage, the plating biasing voltage being configured for causing deposition of the metal on the seed layer and the de-plating biasing voltage being configured for etching away the deposition of the metal from each opening of the one or more features.

26 ~~57~~. The method of claim ~~32~~ 1, wherein applying the pulsed biasing voltage comprises applying a positive plating current alternated with a negative de-plating current.

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27 ~~58~~. The method of claim 1 ~~32~~, wherein applying the pulsed biasing voltage comprises applying a positive plating current alternated with a negative de-plating current, the positive plating current being configured for causing deposition of the metal inside the features.

28 ~~59~~. The method of claim 1 ~~32~~, wherein applying the pulsed biasing voltage comprises applying a positive plating current alternated with a negative de-plating current, the positive plating current being configured for causing deposition of the metal inside the features, the negative de-plating current being configured for keeping each opening of the features open while the metal is being deposited inside the features.

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29 ~~60~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are applied for about less than 5 seconds, wherein the first biasing voltage ranges from about 1 to about 5 volts, wherein the second biasing voltage ranges from about 2 volts to about 10 volts, and wherein applying the pulsed biasing voltage comprises applying a positive plating current alternated with a negative de-plating current, the positive plating current being configured for causing deposition of the metal inside the features, the negative de-plating current being configured for keeping each opening of the features open while the metal is being deposited inside the features.

30 ~~61~~. The method of claim 1 ~~32~~, wherein the electrolyte solution is acidic.

31 ~~62~~. The method of claim 1 ~~32~~, wherein the electrolyte solution has a low pH.

32 ~~63~~. The method of claim 1 ~~32~~, wherein the first biasing voltage is configured for causing deposition of the metal on the seed layer.

33 ~~64~~. The method of claim 1 ~~32~~, wherein the first biasing voltage is configured to limit etching of the seed layer by the electrolyte solution.

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~~65~~. The method of claim 1 ~~32~~, wherein the second biasing voltag is configured for causing deposition of the metal to the seed layer.

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~~66~~. The method of claim 1 ~~32~~, wherein the first biasing voltage and the second biasing voltage are configured for causing deposition of the metal on the seed layer, and wherein the deposition caused by the second biasing voltage is greater than the deposition caused by the first biasing voltage.

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~~67~~. A method of depositing a metal on a substrate having one or more features formed thereon, comprising:

depositing a seed layer over the substrate and the one of more features;

applying a first biasing voltage to the seed layer while immersing the substrate into an electrolyte solution contained in an electrolyte container comprising an anode immersed in the electrolyte solution, the first biasing voltage being configured to limit etching of the seed layer by the electrolyte solution;

applying a second biasing voltage to the seed layer following immersion, the second biasing voltage being configured for causing deposition of the metal to the seed layer; and

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applying a pulsed biasing voltage to the seed layer, the pulsed biasing voltage being configured for applying a positive plating current alternated with a negative de-plating current, the positive plating current being configured for causing deposition of the metal inside the features, the negative de-plating current being configured for keeping each opening of the features open while the metal is being deposited inside the features by the positive plating current.

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~~68~~. The method of claim 36 ~~67~~, further comprising, prior to applying the pulsed biasing voltage, applying a third biasing voltage to the seed layer, the third biasing voltage being lower than the second biasing voltage.

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~~69~~. The method of claim 36 ~~67~~, wherein the first biasing voltage ranges from about 1 volt to about 5 volts.

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39 ~~70~~. The method of claim 34 ~~67~~, wherein the second biasing voltag ranges from about 2 volts to about 10 volts.

40 ~~71~~. The method of claim 34 ~~67~~, wherein the second biasing voltage is about 5 volts.

41 ~~72~~. The method of claim 36 ~~67~~, wherein the first biasing voltage and the second biasing voltage are applied from about 0.25 seconds to about 2 seconds.

42 ~~73~~. The method of claim 34 ~~67~~, wherein the first biasing voltage and the second biasing voltage are applied for less than about 5 seconds.

43 ~~74~~. The method of claim 34 ~~67~~, wherein the pulsed biasing voltage is pulsed for a plurality of cycles as determined by the depth of the one or more features.

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44 ~~75~~. The method of claim 34 ~~67~~, wherein the pulsed biasing voltage is pulsed for about fifteen cycles.

45 ~~76~~. The method of claim 34 ~~67~~, wherein the pulsed biasing voltage is applied for about 4 seconds.

46 ~~77~~. The method of claim 34 ~~67~~, wherein the pulsed biasing voltage is applied from about 1 second to about 7 seconds.

47 ~~78~~. An apparatus for depositing a metal on a substrate having one or more features formed thereon, comprising:

a means for depositing a seed layer over the substrate and the one of more features;

a means for applying a first biasing voltage to the seed layer while the substrate is being immersed into an electrolyte solution contained in an electrolyte container comprising an anode immersed in the electrolyte solution;

a means for applying a second biasing voltage to the seed layer following immersion, the second biasing voltage being higher than the first biasing voltage; and

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a means for applying a pulsed biasing voltage to the seed layer, the pulsed biasing voltage being lower than the second biasing voltage.

~~79~~ 48. The apparatus of claim ~~78~~ 47, wherein the means for applying the first biasing voltage comprises a means for causing deposition of the metal on the seed layer.

~~80~~ 49. The apparatus of claim ~~78~~ 47, wherein the means for applying the first biasing voltage comprises a means for limiting etching of the seed layer.

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~~81~~ 50. The apparatus of claim ~~78~~ 47, wherein the means for applying the second biasing voltage comprises a means for causing deposition of the metal on the seed layer.

~~82~~ 51. The apparatus of claim ~~78~~ 47, further comprising a means for applying a third biasing voltage to the seed layer, the third biasing voltage being less than the second biasing voltage.

~~83~~ 52. The apparatus of claim ~~78~~ 47, wherein the means for applying the pulsed biasing voltage comprises a means for causing deposition of the metal on the seed layer and a means for etching away the deposition of the metal from each opening of the one or more features.

~~84~~ 53. The apparatus of claim ~~78~~ 47, wherein the means for applying the pulsed biasing voltage comprises a means for applying a positive plating current and a means for applying a negative de-plating current. --

REMARKS

This is intended as a full and complete response to the Office Action dated April 10, 2002, having a shortened statutory period for response set to expire on July 10, 2002. Claims 1-31 have been cancelled. New claims 32-84 have been added. The specification has been amended to correct a typographical error. No new

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